WO 03/082891 PCT/KR03/00631

What is claimed is:

15

20

25

30

1. A dendritic cell-specific polynucleotide comprising a nucleotide sequence of SEQ ID NOs:1, 3, 4, 5 or 6.

46

- 5 2. A dendritic cell-specific polypeptide encoded by a nucleotide sequence of SEQ ID NOs:1, 3, 4, 5 or 6.
 - 3. A method for detecting a dendritic cell comprising the steps of:
- 10 (a) hybridizing a DNA obtained from a cell or its fragment with a dendritic cell-specific nucleotide sequence; and
 - (b) verifying the occurrence of the hybridization;

wherein said dendritic cell-specific nucleotide sequence is selected from the group consisting of myosin phosphatase 1 gene, CD20-like precursor target subunit gene, Ιq superfamily protein gene, glycoprotein nmb gene, lipoxygenase activating protein gene, dihydropyrimidinase related protein-2 gene, cystatin A gene, Immunoglobulin transcription factor 2 gene, transforming growth factor betainduced 68kD gene, myeloid DAP12-associating lectin gene, B linker protein gene, activated RNA polymerase II cell transcription cofactor 4 gene, enolase 1 alpha gene, 90 kDa heat shock protein gene, accessory proteins BAP31/BAP29 gene, isocitrate dehydrogenase 3 (NAD^{+}) alpha gene, microsomal glutathione S-transferase 2 gene, GABA(A) receptor-associated protein gene, nicastrin gene, purinergic receptor (family A group 5) gene, Rho GDP dissociation inhibitor beta gene, MAD homolog 2 gene, MLN51 gene, interferon regulatory factor 4 gene, the fragments of these genes, a polynucleotide of SEQ ID NO:1 or its fragment, a polynucleotide of SEQ ID NO:2 or its

5

15

25

30

fragment, a polynucleotide of SEQ ID NO:3 or its fragment, a polynucleotide of SEQ ID NO:4 or its fragment, polynucleotide of NO:5 or its fragment, SEQ ΙD polynucleotide of SEQ ID NO:6 or its fragment and the combination thereof.

47

PCT/KR03/00631

- 4. A method for identifying a lymphoid CD11c dendritic cell comprising the steps of:
- (a) hybridizing a DNA obtained from a cell or its fragment

 with a CD11c dendritic cell-specific nucleotide sequence;

 and
 - (b) verifying the occurrence of the hybridization;

wherein said lymphoid CD11c dendritic cell-specific nucleotide sequence is selected from the group consisting of 5-lipoxygenase activating protein gene or its fragment, dihydropyrimidinase related protein-2 gene or its fragment, interferon regulatory factor 4 gene or its fragment and the combination thereof.

- 20 5. A method for identifying a myeloid monocyte-derived dendritic cell comprising the steps of:
 - (a) hybridizing a DNA obtained from a cell or its fragment with a myeloid monocyte-derived dendritic cell-specific nucleotide sequence; and
 - (b) verifying the occurrence of the hybridization;

wherein said myeloid monocyte-derived dendritic cell-specific nucleotide sequence is selected from the group consisting of thymus and activation-regulated chemokine gene or its fragment, dihydropyrimidinase related protein-2 gene or its fragment, lysosomal acid lipase gene or its fragment,

WO 03/082891

15

20

25

30

thereof.

calmodulin gene or its fragment, interferon regulatory factor 4 gene or its fragment, DC-Lamp gene or its fragment and the combination thereof.

PCT/KR03/00631

- 6. A method for identifying a myeloid CD1a+ dendritic cell 5 · comprising the steps of:
 - (a) hybridizing a DNA obtained from a cell or its fragment with a myeloid CD1a+ dendritic cell-specific nucleotide sequence; and
- (b) verifying the occurrence of the hybridization; 10

myeloid CDla+ dendritic cell-specific wherein said nucleotide sequence is selected from the group consisting of a ID NO:2 or its fragment, of SEQ polynucleotide its polynucleotide of ID NO:3 or fragment, SEQ polynucleotide of SEQ ID NO:5 or its fragment, S100 calciumits fragment, or binding protein beta gene metalloproteinase 12 gene or its fragment, thymus activation-regulated chemokine gene or its fragment, CD1B antigen gene or its fragment, CD20-like precursor gene or its HLA-DQ-alpha chain gene or its ΙΙ fragment, MHC class fragment, osteopontin gene or its fragment, 5-lipoxygenase activating protein gene or its fragment, monocyte chemotactic proteins 4 gene or its fragment, lysosomal acid lipase gene or its fragment, cystatin A gene or its fragment, annexin A2 gene or its fragment, vesicle-associated membrane protein 8 gene or its fragment, MHC class II HLA-DM-alpha chain gene or its fragment, DORA protein gene or its fragment, DC-Lamp gene or its fragment, Mannose receptor (CD206) gene or its fragment, Langerin (CD207) gene or its fragment and the combination

- 7. A method for identifying a myeloid CD14⁺ dendritic cell comprising the steps of:
 - (a) hybridizing a DNA obtained from a cell or its fragment with a myeloid CD14⁺ dendritic cell-specific nucleotide sequence; and
 - (b) verifying the occurrence of the hybridization;

10

15

20

25

30

myeloid CD14⁺ dendritic cell-specific wherein said nucleotide sequence is selected from the group consisting of a polynucleotide of SEQ ID NO:2 or its fragment, S100 calciumbinding protein beta gene or its fragment, myosin phosphatase target subunit 1 gene or its fragment, CD20-like precursor gene or its fragment, Ig superfamily protein gene or its fragment, glycoprotein nmb gene or its fragment, osteopontin gene or its fragment, 5-lipoxygenase activating protein gene or its fragment, mannose receptor C type 1 gene or its fragment, monocyte chemotactic proteins 4 gene or fragment, RNase A family 1 (RNas1) gene or its fragment, lysosomal acid lipase gene or its fragment, cystatin A gene or its fragment, monocyte chemotactic proteins 1 (MCP 1) gene or its fragment, transforming growth factor beta-induced 68kD gene or its fragment, ferritin light polypeptide gene or its fragment, vesicle-associated membrane protein 8 gene or its fragment, Mannose receptor (CD206) gene or its fragment and the combination thereof.

- 8. A method for identifying a maturation stage of a lymphoid CD11c dendritic cell comprising the steps of:
- (a) hybridizing a DNA obtained from a cell or its fragment with an interferon regulatory factor 4 gene or its

PCT/KR03/00631

fragment; and

WO 03/082891

- (b) verifying the occurrence of the hybridization.
- 9. A method for identifying a maturation stage of a myeloid monocyte-derived dendritic cell comprising the steps of:
 - (a) hybridizing a DNA obtained from a cell or its fragment with a nucleotide sequence; and
 - (b) verifying the occurrence of the hybridization;

wherein said nucleotide sequence is selected from the group consisting of thymus and activation-regulated chemokine gene or its fragment, dihydropyrimidinase related protein-2 gene or its fragment, interferon regulatory factor 4 gene or its fragment, DC-Lamp gene or its fragment and the combination thereof.

15

20

25

30

10

5

- 10. A method for identifying a maturation stage of a myeloid CD1a⁺ dendritic cell comprising the steps of:
 - (a) hybridizing a DNA obtained from a cell or its fragment with a nucleotide sequence; and
 - (b) verifying the occurrence of the hybridization;

wherein said nucleotide sequence is selected from the group consisting of a polynucleotide of SEQ ID NO:2 or its fragment, its fragment, SEQ ID NO:3 or polynucleotide of polynucleotide of SEQ ID NO:5 or its fragment, S100 calciumfragment, matrix protein beta gene or its binding 12 gene or its fragment, thymus and metalloproteinase activation-regulated chemokine gene or its fragment, CD1B antigen gene or its fragment, CD20-like precursor gene or its class II HLA-DQ-alpha chain gene or its MHC fragment, fragment, its monocyte fragment, osteopontin gene or

WO 03/082891 PCT/KR03/00631

51

chemotactic proteins 4 gene or its fragment, lysosomal acid lipase gene or its fragment, cystatin A gene or its fragment, transforming growth factor beta-induced 68kD gene or its fragment, annexin A2 gene or its fragment, vesicle-associated membrane protein 8 gene or its fragment, DORA protein gene or its fragment, DC-Lamp gene or its fragment, Langerin (CD207) gene or its fragment and the combination thereof.

- 11. A method for identifying a maturation stage of a myeloid

 10 CD14⁺ dendritic cell comprising the steps of:
 - (a) hybridizing a DNA obtained from a cell or its fragment with a nucleotide sequence; and
 - (b) verifying the occurrence of the hybridization;

wherein said nucleotide sequence is selected from the group consisting of a polynucleotide of SEQ ID NO:2 or its fragment, S100 calcium-binding protein beta gene or its fragment, CD20like precursor gene or its fragment, Ig superfamily protein gene or its fragment, glycoprotein nmb gene or its fragment, osteopontin gene or its fragment, 5-lipoxygenase activating protein gene or its fragment, mannose receptor C type 1 gene or its fragment, monocyte chemotactic proteins 4 gene or its fragment, RNase A family 1 gene or its fragment, lysosomal acid lipase gene or its fragment, cystatin A gene or its fragment, monocyte chemotactic proteins 1 gene fragment, transforming growth factor beta-induced 68kD gene or its fragment, ferritin light polypeptide gene or its fragment, vesicle-associated membrane protein 8 gene or its fragment, Mannose receptor (CD206) gene or its fragment and the combination thereof.

5

15

20

25

12. A microarray for detecting a dendritic cell comprising a dendritic cell-specific nucleotide sequence immobilized on a solid surface;

52

PCT/KR03/00631

wherein said dendritic cell-specific nucleotide sequence is selected from the group consisting of myosin phosphatase 5 gene, CD20-like precursor gene, target subunit 1 5superfamily protein gene, glycoprotein nmb lipoxygenase activating protein gene, dihydropyrimidinase related protein-2 gene, cystatin A gene, Immunoglobulin transcription factor 2 gene, transforming growth factor beta-10 induced 68kD gene, myeloid DAP12-associating lectin gene, B linker protein gene, activated RNA polymerase II cell transcription cofactor 4 gene, enolase 1 alpha gene, 90 kDa heat shock protein gene, accessory proteins BAP31/BAP29 gene, isocitrate dehydrogenase 3 (NAD*) alpha gene, microsomal 15 glutathione S-transferase 2 gene, GABA(A) receptor-associated protein gene, nicastrin gene, purinergic receptor (family A group 5) gene, Rho GDP dissociation inhibitor beta gene, MAD homolog 2 gene, MLN51 gene, interferon regulatory factor 4 gene, the fragments of these genes, a polynucleotide of SEQ ID 20 NO:1 or its fragment, a polynucleotide of SEQ ID NO:2 or its fragment, a polynucleotide of SEQ ID NO:3 or its fragment, a NO:4 its fragment, SEQ ID or polynucleotide of or NO:5 its fragment, polynucleotide of SEQ ID polynucleotide of SEQ ID NO:6 or its fragment and the 25 combination thereof.

13. A microarray for identifying a lymphoid CDllc dendritic cell comprising a lymphoid CDllc dendritic cell-specific nucleotide sequence immobilized on a solid surface;

30

wherein said lymphoid CD11c dendritic cell-specific nucleotide sequence is selected from the group consisting of 5-lipoxygenase activating protein gene or its fragment, dihydropyrimidinase related protein-2 gene or its fragment, interferon regulatory factor 4 gene or its fragment and the combination thereof.

53

PCT/KR03/00631

14. A microarray for identifying a myeloid monocyte-derived dendritic cell comprising a myeloid monocyte-derived dendritic cell-specific nucleotide sequence immobilized on a solid surface;

wherein said myeloid monocyte-derived dendritic cellspecific nucleotide sequence is selected from the group
consisting of thymus and activation-regulated chemokine gene
or its fragment, dihydropyrimidinase related protein-2 gene or
its fragment, lysosomal acid lipase or its fragment,
calmodulin gene or its fragment, interferon regulatory factor
4 gene or its fragment, DC-Lamp gene or its fragment and the
combination thereof.

20

25

30

5

10

15

15. A microarray for identifying a myeloid CD1a⁺ dendritic cell comprising a myeloid CD1a⁺ dendritic cell-specific nucleotide sequence immobilized on a solid surface;

CD1a⁺ dendritic cell-specific said myeloid wherein nucleotide sequence is selected from the group consisting of a SEQ ID NO:2 or its fragment, polynucleotide of its fragment, SEQ ID NO:3 or polynucleotide of polynucleotide of SEQ ID NO:5 or its fragment, S100 calciumits fragment, protein beta gene or binding 12 gene or its fragment, thymus and metalloproteinase

WO 03/082891

5

10

20

25

30

activation-regulated chemokine gene or its fragment, CD1B antigen gene or its fragment, CD20-like precursor gene or its II HLA-DQ-alpha chain gene or fragment, MHC class fragment, osteopontin gene or its fragment, 5-lipoxygenase activating protein gene or its fragment, monocyte chemotactic proteins 4 gene or its fragment, lysosomal acid lipase gene or its fragment, cystatin A gene or its fragment, annexin A2 gene or its fragment, vesicle-associated membrane protein 8 gene or its fragment, MHC class II HLA-DM-alpha chain gene or its fragment, DORA protein gene or its fragment, DC-Lamp gene or its fragment, Mannose receptor (CD206) gene or its fragment, Langerin (CD207) gene or its fragment and the combination thereof.

PCT/KR03/00631

16. A microarray for identifying a myeloid CD14⁺ dendritic 15 cell comprising a myeloid CD14 dendritic cell-specific nucleotide sequence immobilized on a solid surface;

CD14⁺ dendritic cell-specific wherein said myeloid nucleotide sequence is selected from the group consisting of a polynucleotide of SEQ ID NO:2 or its fragment, S100 calciumbinding protein beta gene or its fragment, myosin phosphatase target subunit 1 gene or its fragment, CD20-like precursor gene or its fragment, Ig superfamily protein gene or its fragment, glycoprotein nmb gene or its fragment, osteopontin gene or its fragment, 5-lipoxygenase activating protein gene or its fragment, mannose receptor C type 1 gene or its fragment, monocyte chemotactic proteins 4 gene or its fragment, RNase A family 1 (RNas 1) gene or its fragment, lysosomal acid lipase gene or its fragment, cystatin A gene or its fragment, monocyte chemotactic proteins 1 (MCP 1) gene or

5

10

55

PCT/KR03/00631

its fragment, transforming growth factor beta-induced 68kD gene or its fragment, ferritin light polypeptide gene or its fragment, vesicle-associated membrane protein 8 gene or its fragment, Mannose receptor (CD206) gene or its fragment and the combination thereof.

- 17. A microarray for identifying a maturation stage of a lymphoid CD11c dendritic cell comprising an interferon regulatory factor 4 gene or its fragment immobilized on a solid surface.
- 18. A microarray for identifying a maturation stage of a myeloid monocyte-derived dendritic cell comprising a nucleotide sequence immobilized on a solid surface;
- wherein said nucleotide sequence is selected from the group consisting of thymus and activation-regulated chemokine gene or its fragment, dihydropyrimidinase related protein-2 gene or its fragment, interferon regulatory factor 4 gene or its fragment, DC-Lamp gene or its fragment and the combination thereof.
 - 19. A microarray for identifying a maturation stage of a myeloid CD1a⁺ dendritic cell comprising a nucleotide sequence immobilized on a solid surface;
- wherein said nucleotide sequence is selected from the group 25 consisting of a polynucleotide of SEQ ID NO:2 or its fragment, SEQ ID NO:3 or its fragment, a polynucleotide of polynucleotide of SEQ ID NO:5 or its fragment, S100 calciumits fragment, matrix protein beta gene or binding 12 gene or its fragment, thymus and 30 metalloproteinase

10

15

20

25

30

WO 03/082891 PCT/KR03/00631

activation-regulated chemokine gene or its fragment, CD1B antigen gene or its fragment, CD20-like precursor gene or its fragment, MHC class II HLA-DQ-alpha chain gene or its fragment, osteopontin gene orits fragment, monocyte chemotactic proteins 4 gene or its fragment, lysosomal acid lipase gene or its fragment, cystatin A gene or its fragment, transforming growth factor beta-induced 68kD gene or its fragment, annexin A2 gene or its fragment, vesicle-associated membrane protein 8 gene or its fragment, DORA protein gene or its fragment, DC-Lamp gene or its fragment, Langerin (CD207) gene or its fragment and the combination thereof.

20. A microarray for identifying a maturation stage of a myeloid CD14⁺ dendritic cell comprising a nucleotide sequence immobilized on a solid surface;

wherein said nucleotide sequence is selected from the group consisting of a polynucleotide of SEQ ID NO:2 or its fragment, S100 calcium-binding protein beta gene or its fragment, CD20like precursor gene or its fragment, Ig superfamily protein gene or its fragment, glycoprotein nmb gene or its fragment, osteopontin gene or its fragment, 5-lipoxygenase activating protein gene or its fragment, mannose receptor C type 1 gene or its fragment, monocyte chemotactic proteins 4 gene or its fragment, RNase A family 1 gene or its fragment, lysosomal acid lipase gene or its fragment, cystatin A gene or its fragment, monocyte chemotactic proteins 1 gene fragment, transforming growth factor beta-induced 68kD gene or its fragment, ferritin light polypeptide gene or its fragment, vesicle-associated membrane protein 8 gene or its fragment, Mannose receptor (CD206) gene or its fragment and the

WO 03/082891 PCT/KR03/00631

. 57

combination thereof.